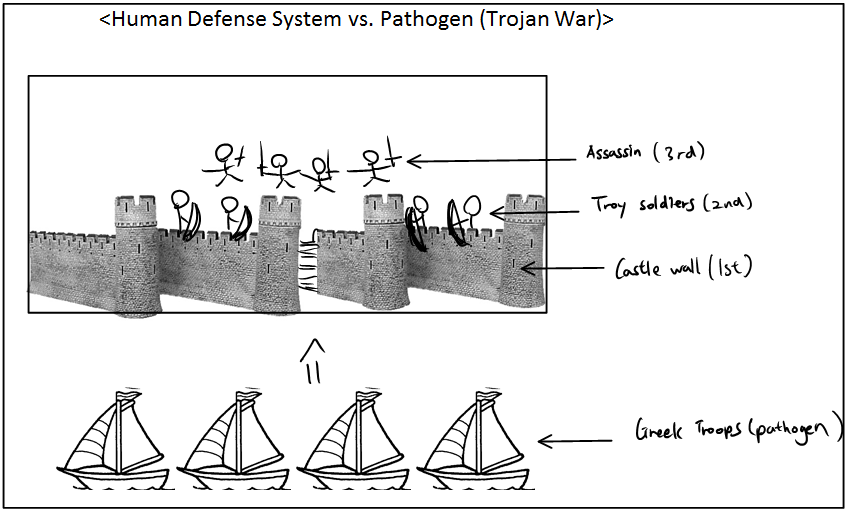
1. Explain how the human defense system works, using the idea of the three lines of defense.

**Human Defense System**  
There are 3 lines of defense in a human defense system. This system tries to protect the body against pathogens, which refer to fungi, virus, and/or bacteria constantly trying to invade the body through different holes and spaces. The relationship between the human defense system and pathogen can be represented through different factors in Trojan War.

**Human Defense System: Troy Kingdom**  
**Pathogen: Greek Troops (invaders)**  
The Trojan War occurs because Greek Troops invade Troy. The Greek Troop’s official objective was to take back one of the emperor’s wife back. However, they also planned destroy to Troy completely. In the war, Greek Troops were like pathogens that attack our body.

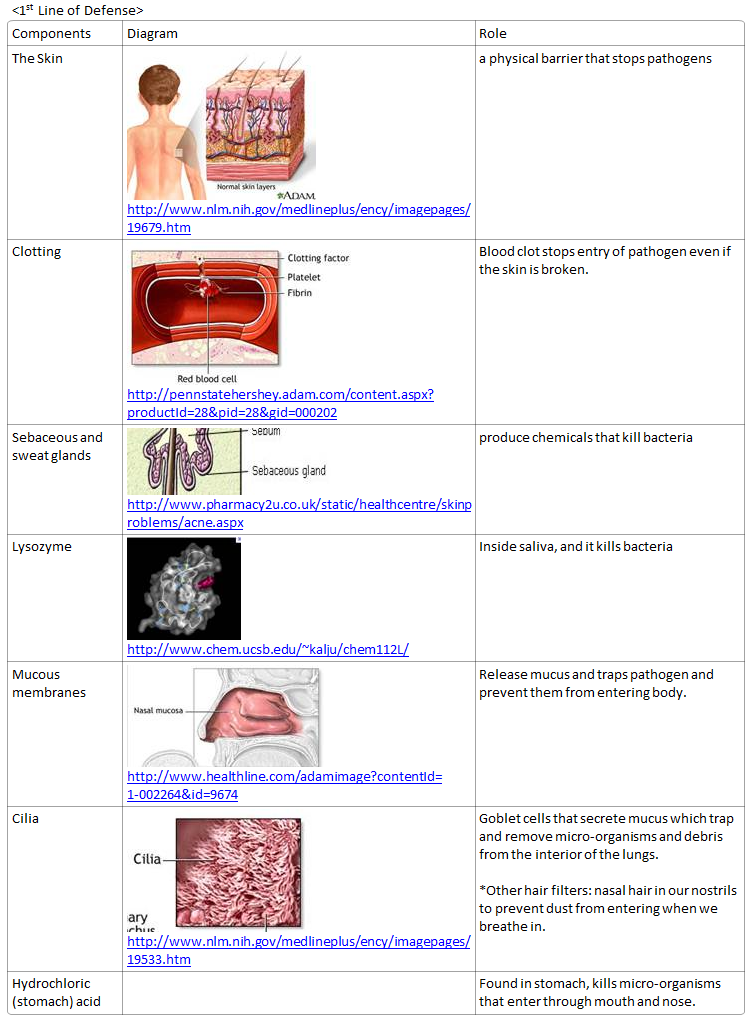
**The Gate: Holes**

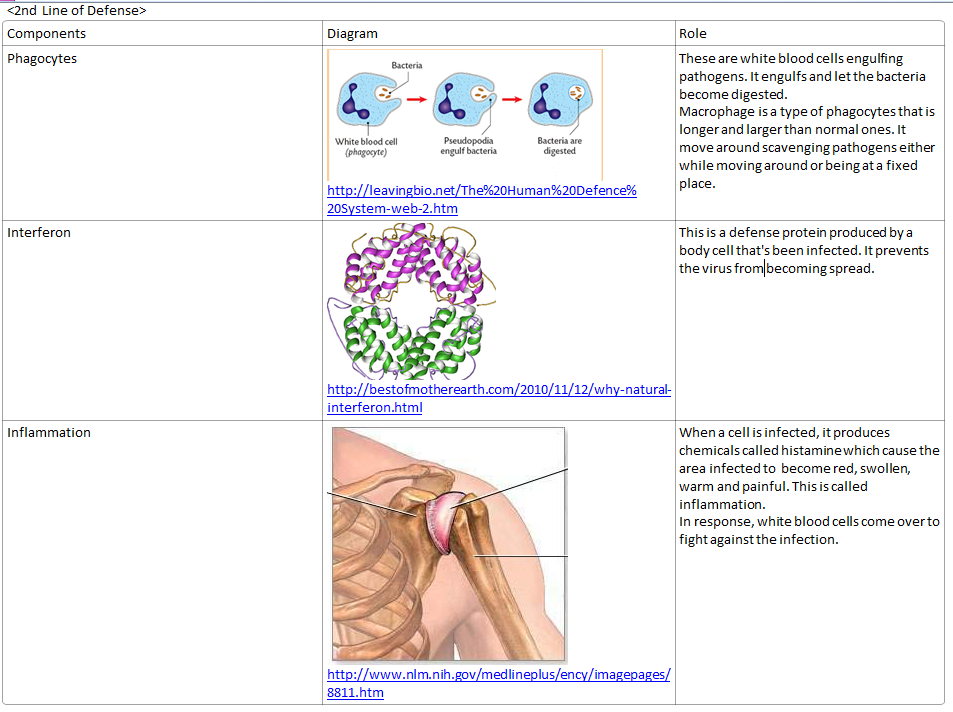
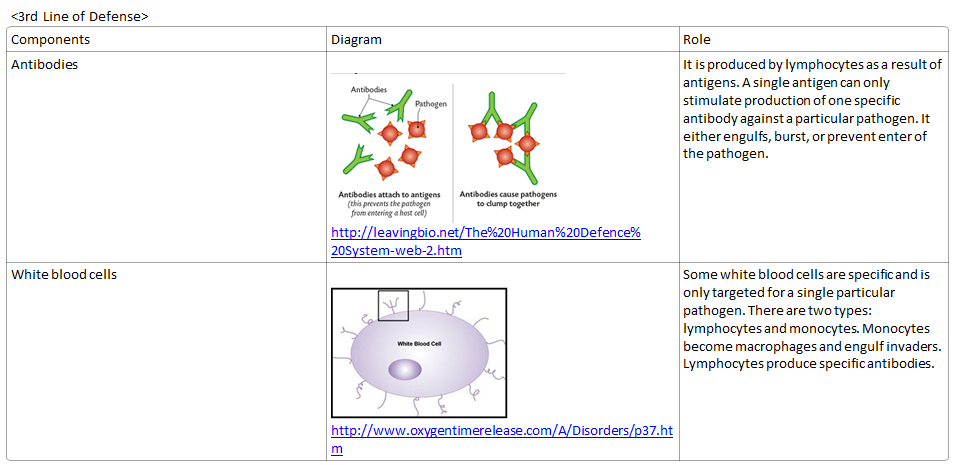
**Usually, the pathogen enters through holes such as mouth, nose, broken skin etc. This is similar to gate of a castle wall, because when it opens it can let harmful beings come in.**

**1st line of defense: Castle Wall**  
1st line of defense is a physical barrier trying to block out all pathogens that can enter the body. Some of the examples of this line are the skin. Like a castle wall, it is non-specific to what it blocks but tries to block out any intruders or invaders. However, the actual physical barrier of our general defense system is not as simple as castle wall. Also, unlike castle wall, some of the physical barrier in our general defense system not only block, but kill/ trap and take other actions to prevent the pathogen. This is done by barriers such as mucous membrane, stomach acid etc. Thereby, they try to keep microbes from penetrating sterile body compartments in the first place.   
  
**2nd line of defense: Troy soldiers**  
This line of defense takes over if the pathogen manages to get past the first one. It is also a non-specific defense system where it tries to fight off any pathogens. However, one major difference between the first and the second defense is that the 2nd line actually tries to 'fights off' and not just block. The cellular and chemical system immediately responds once a pathogen penetrates. Therefore, they take more action and processes. For example, once the skin is broken and micro-organism penetrates into our body, white blood cells engulf it and let it become digested. This line of defense is just like soldiers inside their castle wall (1st line of defense) fighting off enemies who have managed to intrude into the walls.

**The 3rd line of defense: Assassins**

Unlike the other two, is a specific defense system where the system attacks specific invaders. This defense system is like assassins who are asked to kill major threats. Inside our body, this can happen by the production of antibodies or by specialized white blood cells engulfing and destroying the particular pathogen. These days, artificial active immunity is also used, called vaccination. In this way, it’s like an assassin assigned to remove a certain being.



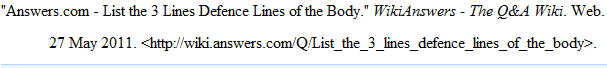


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